



# FCC Test Report

APPLICANT : Relay, Inc.  
EQUIPMENT : Relay Beacon XL2  
BRAND NAME : Relay  
MODEL NAME : RY0280  
FCC ID : 2AMBHRY0280  
STANDARD : 47 CFR Part 15 Subpart B  
CLASSIFICATION : Certification  
TEST DATE(S) : Aug. 26, 2024

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia



Approved by: Jason Jia

**Sporton International Inc. (Kunshan)**

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300  
People's Republic of China**



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### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
-	15.107	AC Conducted Emission	< 15.107 limits	Not Applicable	Not connect to AC Mains
3.1	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 17.24 dB at 785.63 MHz

<b>Conformity Assessment Condition:</b>
The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account. Please refer to each test results in the section "Measurement Uncertainty".
<b>Disclaimer:</b>
The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



# 1. General Description

## 1.1. Applicant

Relay, Inc.  
4200 Six Forks Rd, Suite 1800, Raleigh NC 27609, USA

## 1.2. Manufacturer

Relay, Inc.  
4200 Six Forks Rd, Suite 1800, Raleigh NC 27609, USA

## 1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Relay Beacon XL2
Brand Name	Relay
Model Name	RY0280
FCC ID	2AMBHRY0280
EUT supports Radios application	Bluetooth LE
SN	Radiation: 40030300A
HW Version	DVT
SW Version	RelayTag nRF52811 V0.1.8 20240812
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	Bluetooth: 2400 MHz ~ 2483.5 MHz
Rx Frequency	Bluetooth: 2400 MHz ~ 2483.5 MHz
Antenna Type	Bluetooth : PCB Antenna
Type of Modulation	Bluetooth LE : FSK

## 1.5. Modification of EUT

No modifications are made to the EUT during all test items.



### 1.6. Test Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

<b>Test Firm</b>	Sporton International Inc. (Kunshan)		
<b>Test Site Location</b>	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People’s Republic of China TEL : +86-512-57900158		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	03CH02-KS	CN1257	314309

### 1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH02-KS	AUDIX	E3	6.2009-8-24al

### 1.8. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart B
- ANSI C63.4-2014

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.

## 2. Test Configuration of Equipment Under Test

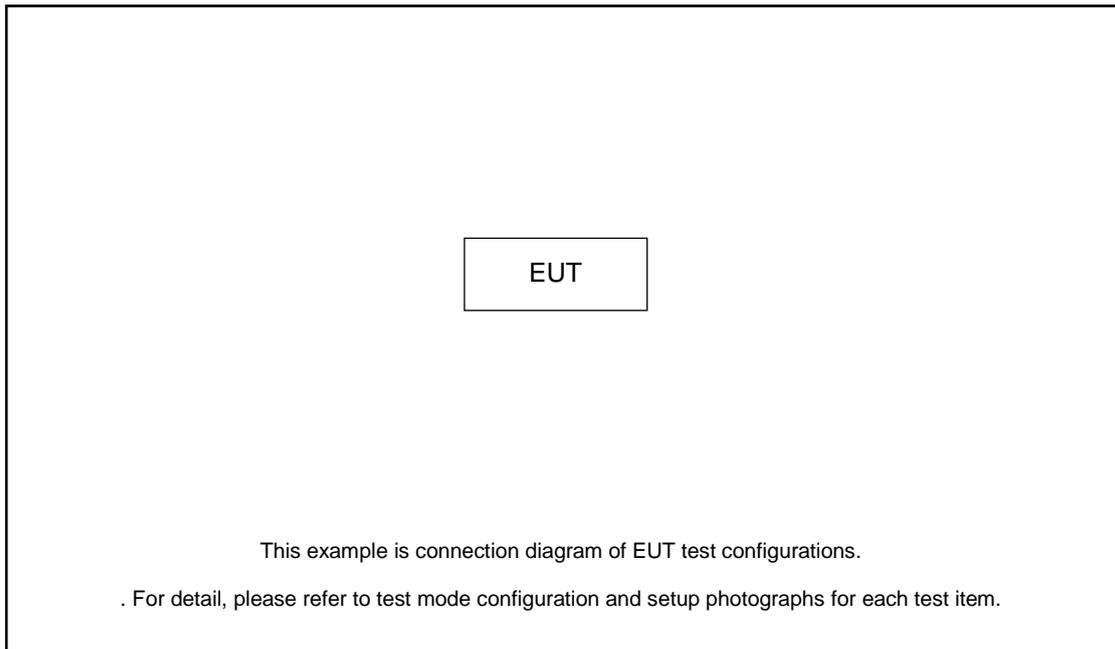
### 2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: radiation emission (30MHz to the 5th harmonic of the highest frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
Radiated Emissions	Mode 1 : Bluetooth Idle + Power by Battery

### 2.2. Connection Diagram of Test System



The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application



### 3. Test Result

#### 3.1. Test of Radiated Emission Measurement

##### 3.1.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

##### 3.1.2. Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

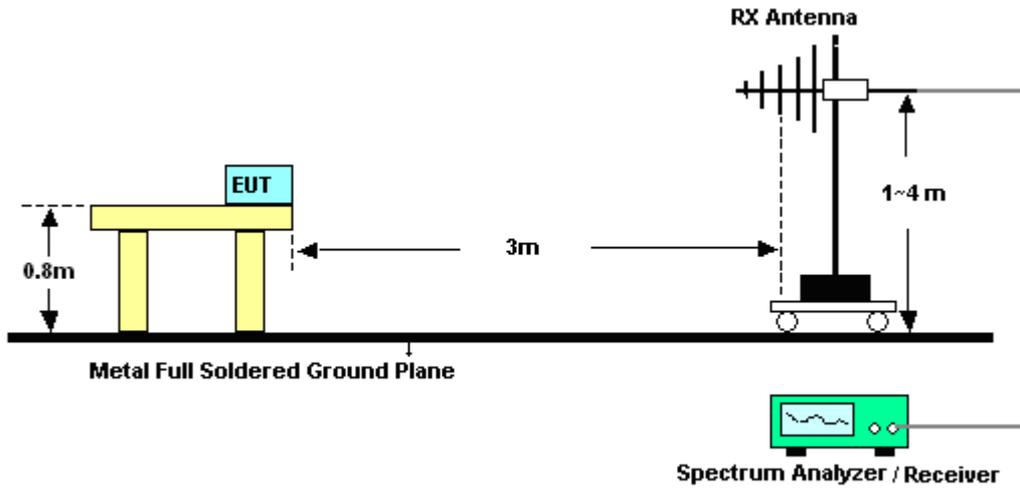


### **3.1.3. Test Procedures**

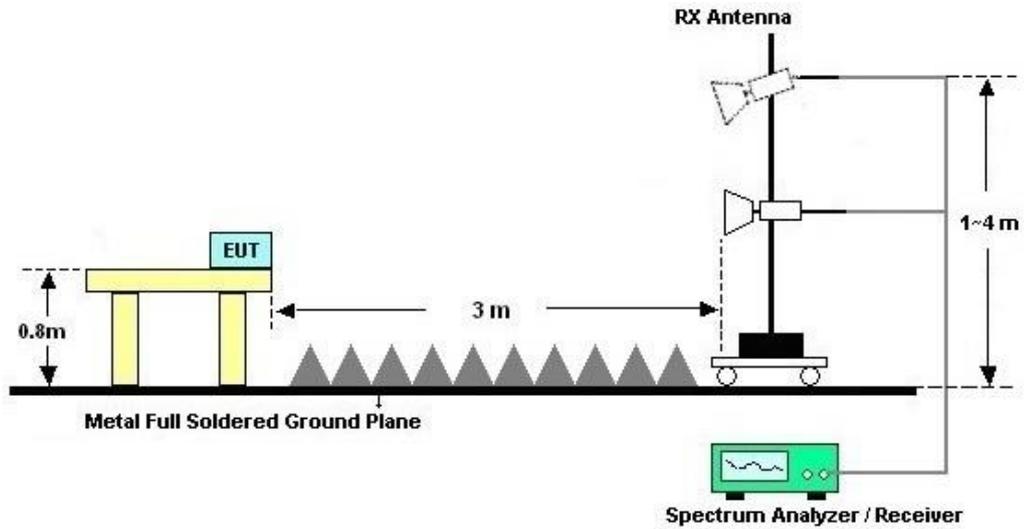
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
10. Exploratory radiated emissions testing of handheld and/or body-worn devices shall include rotation of the EUT through three orthogonal axes (X/Y/Z Plane) to determine the orientation (attitude) that maximizes the emissions.

### 3.1.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



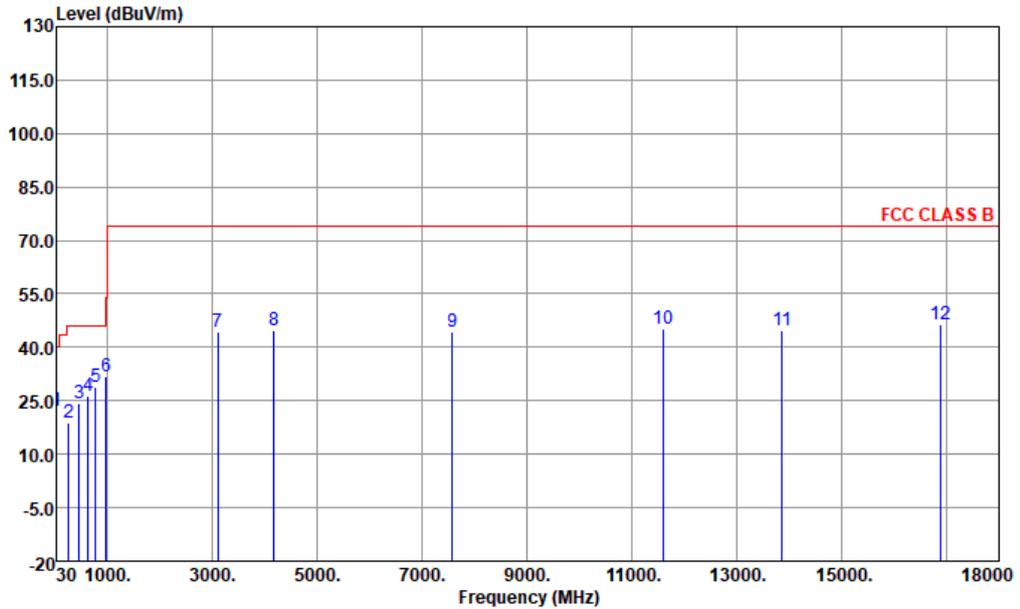
For radiated emissions above 1GHz





3.1.5. Test Result of Radiated Emission

Test Engineer :	Moon	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal

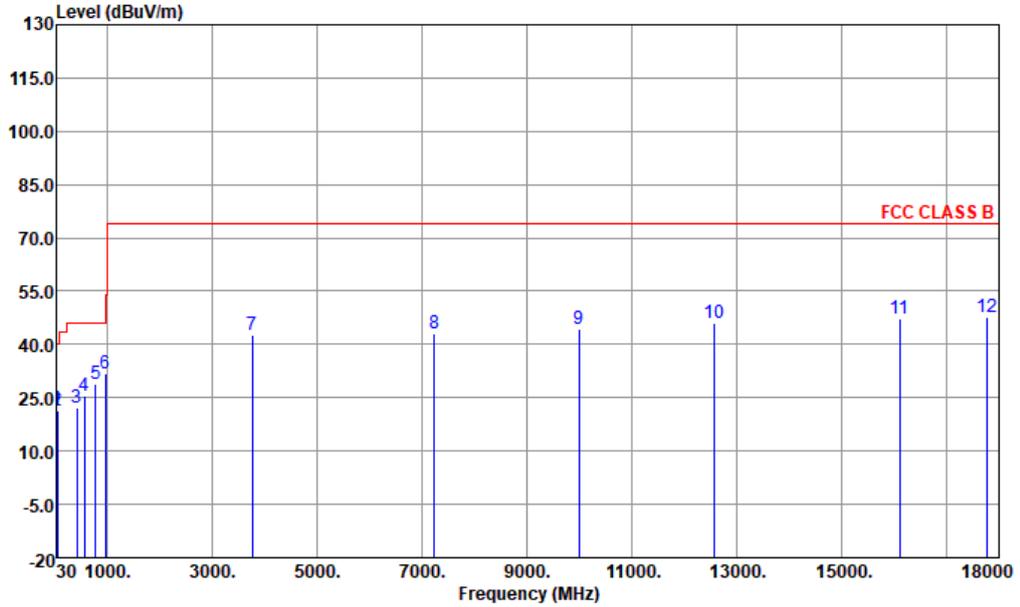


Site : 03CH02-KS  
 Condition : FCC CLASS B 3m 44483 HORIZONTAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.97	22.11	-17.89	40.00	29.36	24.79	0.76	32.80	---	---	Peak
2	264.74	18.70	-27.30	46.00	28.92	20.42	2.23	32.87	---	---	Peak
3	471.35	24.10	-21.90	46.00	30.63	23.43	3.14	33.10	---	---	Peak
4	642.07	26.52	-19.48	46.00	29.51	26.58	3.71	33.28	---	---	Peak
5 p	785.63	28.76	-17.24	46.00	29.20	28.45	4.18	33.07	---	---	Peak
6	975.75	31.97	-22.03	54.00	27.82	30.90	4.64	31.39	---	---	Peak
7	3108.00	44.45	-29.55	74.00	65.95	33.00	8.52	63.02	---	---	Peak
8	4179.00	44.90	-29.10	74.00	64.96	33.87	9.92	63.85	---	---	Peak
9	7579.00	44.14	-29.86	74.00	58.70	35.60	13.73	63.89	---	---	Peak
10	11608.00	45.07	-28.93	74.00	51.12	38.10	17.21	61.36	---	---	Peak
11	13869.00	44.73	-29.27	74.00	49.28	38.57	18.92	62.04	---	---	Peak
12	16895.00	46.48	-27.52	74.00	46.89	41.40	20.96	62.77	---	---	Peak



Test Engineer :	Moon	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical



Site : 03CH02-KS  
 Condition : FCC CLASS B 3m 44483 VERTICAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	36.79	21.89	-18.11	40.00	32.21	21.69	0.80	32.81	---	---	Peak
2	45.52	21.38	-18.62	40.00	36.61	16.58	0.96	32.77	---	---	Peak
3	423.82	22.14	-23.86	46.00	29.47	22.65	3.06	33.04	---	---	Peak
4	562.53	25.54	-20.46	46.00	29.12	26.36	3.30	33.24	---	---	Peak
5 p	777.87	28.74	-17.26	46.00	29.39	28.29	4.16	33.10	---	---	Peak
6	960.23	31.77	-22.23	54.00	27.72	31.00	4.61	31.56	---	---	Peak
7	3771.00	42.48	-31.52	74.00	63.62	33.27	9.40	63.81	---	---	Peak
8	7239.00	43.10	-30.90	74.00	58.14	35.50	13.50	64.04	---	---	Peak
9	9993.00	44.25	-29.75	74.00	53.30	37.20	15.97	62.22	---	---	Peak
10	12577.00	45.98	-28.02	74.00	50.44	39.00	17.92	61.38	---	---	Peak
11	16113.00	47.38	-26.62	74.00	49.06	40.62	20.43	62.73	---	---	Peak
12	17762.00	47.75	-26.25	74.00	48.42	40.87	21.27	62.81	---	---	Peak

Note:

- Level(dBμV/m) = Read Level(dBμV) + Antenna Factor(dB/m) + Cable Loss(dB) - Preamp Factor(dB)
- Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)



### 4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Oct. 11, 2023	Aug. 26, 2024	Oct. 10, 2024	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44G,MAX 30dB	Oct. 11, 2023	Aug. 26, 2024	Oct. 10, 2024	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Dec. 06, 2023	Aug. 26, 2024	Dec. 05, 2024	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 23, 2023	Aug. 26, 2024	Oct. 22, 2024	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	413740	9KHz-1GHz	Jan. 03, 2024	Aug. 26, 2024	Jan. 02, 2025	Radiation (03CH02-KS)
Amplifier	EM	EM01G18G	060806	1GHz~18GHz	Oct. 11, 2023	Aug. 26, 2024	Oct. 10, 2024	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Aug. 26, 2024	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Aug. 26, 2024	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Aug. 26, 2024	NCR	Radiation (03CH02-KS)

NCR: No Calibration Required



## 5. Measurement Uncertainty

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	6.04 dB
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.12 dB
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